

If two different-looking structures can be drawn on paper, but, when models are built for each, if the two models are identical, then this tells you that the two drawings, though different in appearance, represent the same compound. Finally, because the holes are in the correct place, once the model is built, it will have the correct 3-D shape.

### Activity Notes

- The best models currently available are made of polycarbonate. They are durable and almost unbreakable. Provided care is taken to prevent them from getting lost or removed from the classroom, they can easily be expected to last 15 years, something which may be important when planning the purchase of a class set that will cost hundreds of dollars. Once an initial outlay has been made, the class set can be maintained by occasionally buying another set and using it to top up lost parts from the existing class set.
- Have students work in pairs or threes.

### Supporting Diverse Student Needs

- Check with ESL students to ensure they understand the instructions.
- This is a good hands-on activity for tactile and visual learners.
- For enrichment, have students build the three compounds that have the formula  $C_2H_2F_2$ .

### What Did You Find Out? Answers

1. (a) Four  
(b) Two  
(c) One  
(d) One
2. Carbon and oxygen
3. Accept all logical responses. For example, the holes are placed at specific locations, which stick out in three dimensions, especially for carbon. This results in the formation of 3-D molecules.

### ■ USING THE FEATURE

#### Career Connect: Research and Development Chemist, p. 250

Chemistry careers often go in one of three directions—practising as a chemist, as a chemical engineer, or as a springboard to some other application of science. Chemists often work in process development and control (pulp mills, metal refining, chemical production); in analysis (finding out what or how much of something is present, such as the amount of

mercury in a salmon); in organic chemistry (petrochemicals, plastics, pharmaceuticals); or in basic research (at a university or in private industry). Chemical engineering is very application based (taking a process designed by a chemist and modifying it so that it will work at large scales and in a factory setting, or working as an environmental chemist, such as in designing water treatment systems). Many careers begin with a degree in chemistry but lead to other fields such as education, developing public policy on science issues, and forensics, to name a few. This feature shows something that is very common in the development of a chemistry career: initially, the length and breadth of chemistry is studied, and then, as the career develops, there is an increasing focus on a deeper understanding of a much more specialized area.

### Career Connect Answers

1. Acids are used to lower the pH of hair products and emulsifiers.
2. Bases are used to raise the pH of hair products to neutralize chemicals used to set hair.
3. For example: Knowledge of chemistry is used to create and test products for performance, effectiveness, and safety.

### ■ SECTION 5.3 ASSESSMENT, p. 251

#### Check Your Understanding Answers

##### Checking Concepts

1. Organic chemistry is the study of compounds of carbon.
2. (a) Carbon  
(b) Hydrogen
3. Accept all logical answers. For example, carbon can form stable bonds with many different elements, it can form up to four bonds, and it has 3-D shapes.
4. (a) Organic  
(b) Inorganic (but does contain an organic ion, so could also be considered organic)  
(c) Inorganic  
(d) Organic  
(e) Inorganic  
(f) Inorganic  
(g) Organic  
(h) Inorganic  
(i) Inorganic  
(j) Organic
5. A hydrocarbon is a compound formed from the elements carbon and hydrogen.